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# **WATER SUPPLY OUTLOOK FOR WASHINGTON**



**U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE**

Collaborating with

DEPARTMENT OF ECOLOGY STATE OF WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with Federal, State and private organizations listed inside the back cover of this report.

AS OF  
**MAR. 1, 1978**

## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

*COVER PHOTO: SOME OF THE DATA IN THIS REPORT HAVE BEEN RECEIVED THROUGH THE SOIL CONSERVATION SERVICE'S NEW SNOTEL SYSTEM WHICH TRANSMITS INFORMATION VIA THE SPACE AGED METEOR BURST METHOD FROM DATA SITES TO MASTER STATIONS LIKE THESE.*

### PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

### PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P.O. Box 388, Sacramento, California 95802 --- for British Columbia by the Ministry of the Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia V8V 1X5 --- for Yukon Territory by the Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory Y1A 3V1 --- and for Alberta, Saskatchewan, and N.W.T. by the Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta T3C 1A6.





# ***WATER SUPPLY OUTLOOK FOR WASHINGTON***

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

*Issued by*

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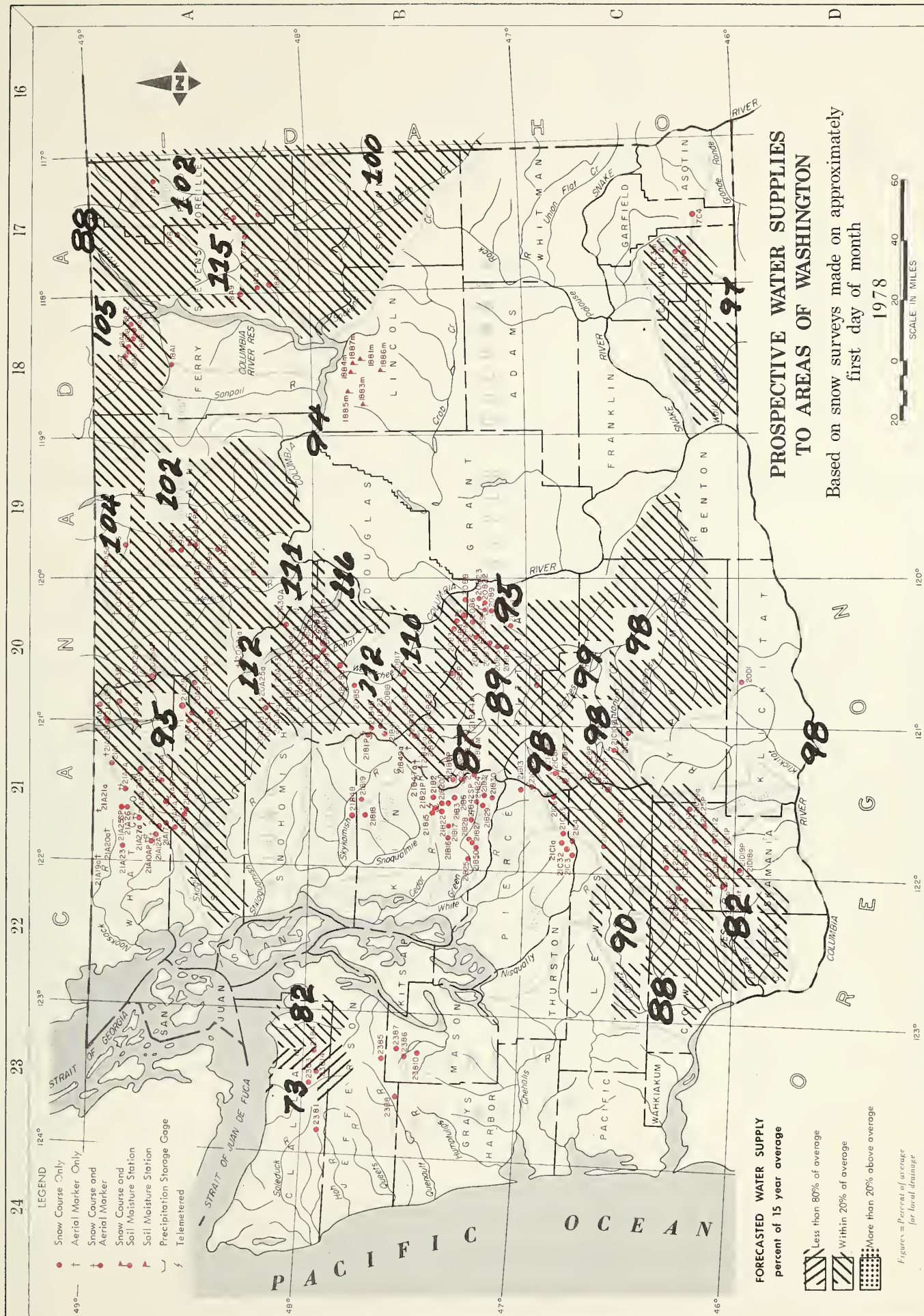
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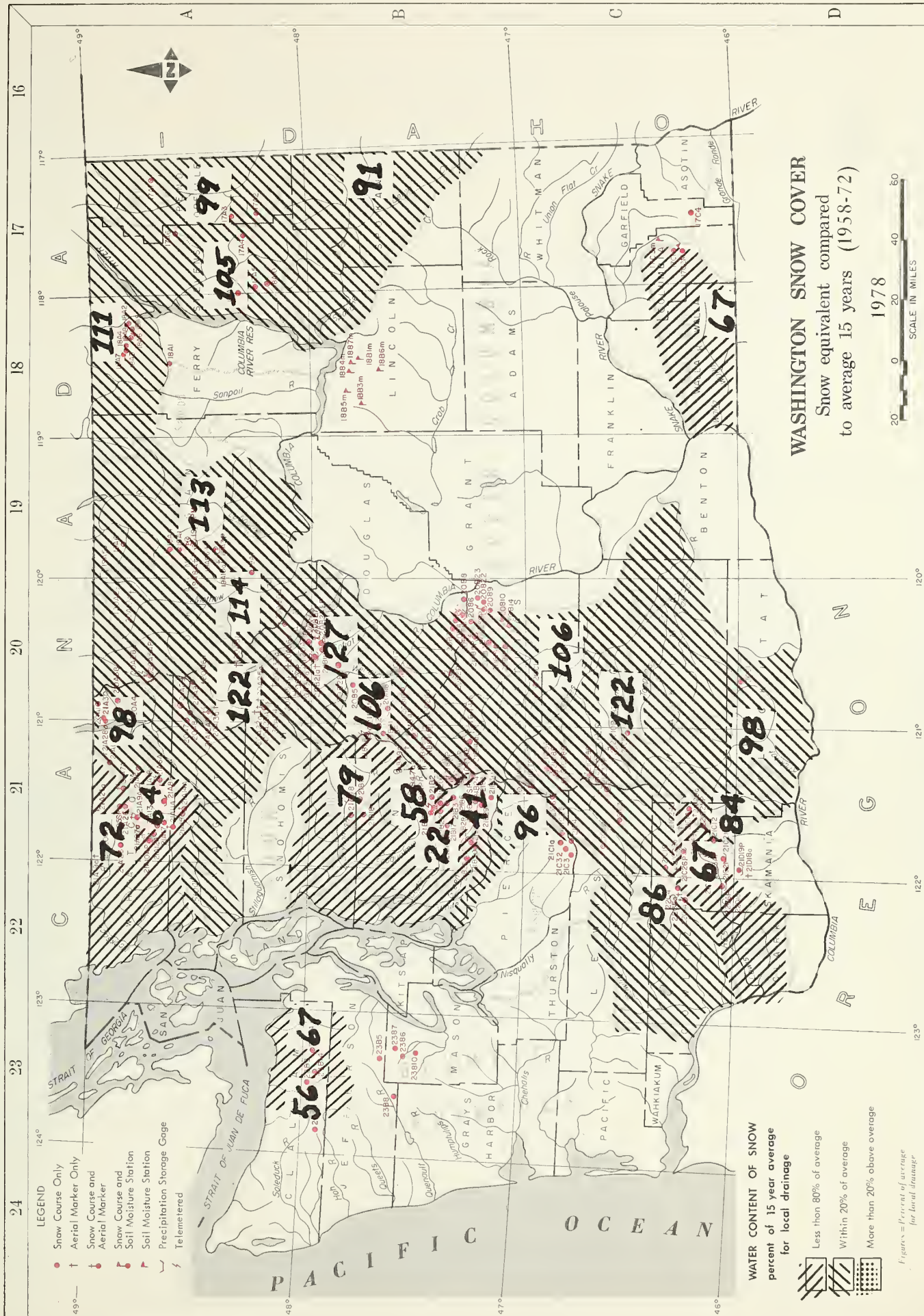




# INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.
<b>UPPER COLUMBIA DRAINAGE</b>					
<b>Pend Oreille River</b>					
Boyer Mountain	1742	7	31N	43E	5250
Bunchgrass Meadow	1741	24	37N	44E	5000
Winchester Creek	1743	30	33N	43E	2970
<b>Kettle River</b>					
Boulder Road	1842	36	39N	36E	1450
Butte Creek	1843	28	39N	35E	4070
Cabin Creek	1848	5	38N	36E	3170
Goat Creek	1844	26	39N	35E	3595
Snow Caps Creek	1845	3	38N	36E	2150
Snow Caps Trail	1846	5	38N	36E	2720
Summit G. S.	1847	20	39N	35E	4600
<b>Colville River</b>					
Baird	1746	19	36N	42E	3215
Carlson	1849	34	32N	38E	2885
Chewelah	1744	11	32N	41E	4925
Stranger Mountain	1745	26	31N	38E	4990
Togo	18410	6	29N	38E	3370
<b>Sonpelt River</b>					
Sherman Creek Pass	1841	19	36N	35E	5350
<b>Okanogan River</b>					
Clark	19A8a	2	36N	23E	7000
Muckamuck	19A9a	30	36N	24E	6750
Mutton Creek No. 1	19A1	30	37N	24E	5750
Mutton Creek No. 2	19A4	19	37N	24E	6000
Payson	20A28a	32	40N	18E	4300
Rusty Creek	19A3P	33	35N	24E	4500
Salmon Meadows	19A2PM	33	35N	24E	4000
Starvation Mtn.	19A10a	15	35N	23E	6750
Touts Coulee	19A6	30	39N	25E	2845
<b>Methow River</b>					
Billy Goat Pass	20A10a	10	38N	20E	6400
Dollar Watch	20A29a	8	39N	20E	7000
Harts Pass	20A5AP	17	37N	18E	6500
Horseshoe Basin	19A5a	15	40N	23E	7000
Loup Loop	19A7	36	34N	23E	4650
<b>Chelon Lake Basin</b>					
Cloudy Pass	20A22a	12	31N	15E	6500
Greenwood Flat	20A25	3	31N	16E	3540
Little Meadows	20A24	8	31N	16E	5275
Lynah Lake	20A23a	18	31N	16E	5900
Park Creek Flat	20A13a	19	34N	16E	2220
Park Creek Ridge	20A12a	18	34N	16E	4600
Petersons	20A16a	3	35N	17E	4730
Rainy Pass	20A16a	21	35N	17E	4730
Safety Harbor	20A30a	32	31N	20E	4300
War Creek Pass	20A31a	34	33N	18E	6500
<b>Entiat River</b>					
Blue Creek G.S.	20A28a	19	28N	18E	5425
Brief	20A19	34	28N	19E	1600
Entiat Meadows	20A33a	28	31N	17E	4540
Entiat River Trail	20A34a	2	29N	17E	3325
Four Mile Ridge	20A27a	15	28N	19E	6800
Goat Camp	20A36a	17	30N	18E	6510
Pope Ridge	20A20P	22	29N	18E	3540
Pope Ridge Snow Pillow	20A25P	22	29N	18E	3540
Pugh Ridge	20A32a	34	30N	18E	6725
Shady Pass	20A37	20	29N	19E	6200
Snow Grushy	20A35a	21	30N	17E	3910
Tommy Creek	20A21a	10	28N	18E	4900
<b>Wenatchee River</b>					
Berne-Mill Creek	21A23	7	26N	15E	3170
Berne-Mill Creek (New)	21A41SP	13	26N	14E	3240
Blewett Pass No. 2	20A2P	43	25N	17E	4270
Chiwaukum G. S.	20A16	4	25N	17E	1810
Lake Wenatchee	20A5	33	27N	17E	1970
Leavenworth R. S.	20A17	1	24N	17E	1127
Merritt	20A18	4	26N	16E	2140
Stevens Pass	21B1P	14	26N	13E	4070
Stevens Pass Sand Shed	21A45	12	26N	19E	3700
<b>Skagit River</b>					
Beaver Creek Trail	21A4	35	39N	12E	2200
Beaver Pass	21A1	9	39N	12E	3680
Brown Top	21A28a	26	40N	12E	6000
Devils Park	20A4	34	38N	16E	5900
Freezeout Creek Trail	20A1	14	40N	14E	3500
Freezeout Meadows New	20A38	8	40N	16E	5000
Granite Creek	21A29	25	36N	16E	3500
Meadows Cabins	20A8	29	36N	14E	1900
New Horzomeen Lake	20A7	19	40N	14E	2800
Thunder Basin	21A30	10	35N	14E	4200
<b>Baker River</b>					
8aker Pass	21A27a	1	37N	7E	4900
Oock Butte	21A11a	8	36N	8E	3800
Easy Pass	21A7a	19	39N	11E	5200
Jasper Pass	21A6a	17	38N	11E	5400
Komo Kulshan	21A17	31	37N	9E	800
Marten Lake	21A9a	23	38N	8E	3600
Mount 8lum	21A18a	27	38N	10E	5800
Rocky Creek	21A12aP	20	37N	8E	2100
Schreibers Meadow	21A10aP	18	37N	8E	3400
S. F. Thunders Creek	21A14a	20	36N	9E	2200
Sulphur Creek	21A13	22	37N	8E	1600
Three Mile Creek	21A15	18	36N	9E	1600
Watson Lakes	21A8P	25	37N	9E	4500
<b>Nooksack River</b>					
Bald Mountain	21A19a	7	40N	7E	4400
Canyon	21A20a	20	40N	8E	5100
Glacier Creek	21A23	9-10	38N	7E	3700
Panorama New	21A26	17	39N	9E	4300
Panorama Snow Pillow	21A25SP	17	39N	9E	4300
Twin Lakes	21A21a	16	40N	9E	5200
<b>OLYMPIC PENINSULA</b>					
<b>Dungeness River</b>					
Deer Park	23B4	1	28N	5W	5200
<b>Morse Creek</b>					
Cox Valley	23B14	31	29N	6W	4500
<b>Elwha River</b>					
Hurricane	23B3	36	29N	7W	4500
<b>Skokomish River</b>					
Black and White	23B7	17	24N	5W	4200
Black and White Lakes	23B6	16	24N	5W	4700
Four Stream	23B0	1	23N	6W	3000
Home Sweet Home	23B5	28	25N	5W	5200
Sundown Pass	23B8	25	24N	7W	3900
<b>Solduck River</b>					
Oer Lake	23B1	14	28N	9W	3900
<b>LEGEND</b>					
NUMBERING SYSTEM EXAMPL:					
SHOW COURSE ONLY					
21A7 AERIAL MARKER ONLY					
21A2a AERIAL MARKER ONLY					
21A2M SHOW COURSE AND SOIL MOISTURE STATION					
21A7M SHOW COURSE AND SOIL MOISTURE STATION					
21A7P SHOW COURSE AND SOIL MOISTURE STATION STORAGE GAGE					
21A7SP PRECIPITATION STORAGE GAGE					
21A7SP SHOW PILLOW					









# WATER SUPPLY OUTLOOK

State of Washington

March 1, 1978

\*\*\*\*\*  
\*\* The March 1 snow survey results are not much different from \*\*  
\*\* those made last month. Some watersheds now show that there \*\*  
\*\* is a higher percentage of normal snow pack while others show \*\*  
\*\* the opposite. Some of this is due to the fact that more \*\*  
\*\* snow courses are measured on the first of March than on the \*\*  
\*\* first of February and some because there was actually a \*\*  
\*\* change in the snow cover percentage. The end result is that \*\*  
\*\* some forecasts have been increased, but most of them have \*\*  
\*\* been lowered from that previously published. Precipitation, \*\*  
\*\* as measured by the National Weather Service, at valley \*\*  
\*\* stations is also a variable factor, with some divisions \*\*  
\*\* reporting above normal rainfall and some below. The end \*\*  
\*\* result of the precipitation and snow cover measurements is \*\*  
\*\* that the water supply for this forthcoming water use season \*\*  
\*\* should be adequate for most needs over the state. Exceptions \*\*  
\*\* to this could possibly be in the Olympic Peninsula and the \*\*  
\*\* Green, Cedar and Snoqualmie Watersheds on the west side, but \*\*  
\*\* even here reservoirs are in good shape and so problems are \*\*  
\*\* not anticipated. \*\*  
\*\*\*\*\*

## SNOW COVER

In the Upper Columbia River Basin in Washington and its immediate tributaries, snow cover ranges from 9 percent below normal on the Spokane River to a high of 27 percent above normal on the Entiat. The Lower Columbia Drainage has a snow pack that ranges from 33 percent below normal on the Lewis and Mill Creek Drainages to 2 percent below normal on the Klickitat, but this, measured by only one snow course. On the Puget Sound Drainage from the Cascades, the snow pack ranges from 2 percent below normal for the Skagit Drainage down to 78 percent below in the Cedar. The Olympic Peninsula measurements show the snow pack in this area to be from 44 percent below normal up to 33 percent below. Comparisons with last years measurements at this time are similar to those reported last month and due to the total lack of snow in 1977, these percentage numbers are ridiculously high and range from 186 to 1224 percent greater.



## RESERVOIRS

The major reservoirs in the state of Washington are now in pretty good shape. The five Yakima irrigation reservoirs have 12 percent above average amounts of water in storage as of March 1. The two Okanogan Irrigation District reservoirs are not as good, being only 54 percent full as of March 1. Power reservoirs, although not full, should all fill with the spring runoff. Flood releases have been started on some reservoir systems but in other cases these flood releases have been curtailed for later adjustments.

## PRECIPITATION

Rainfall in the state ranged from 49 percent below normal to 39 percent above during the month of February. For the winter period, November through February, the precipitation now ranges from 17 percent below normal to 52 percent above. Only the Columbia above Castlegar in British Columbia has substantially below normal amounts of rainfall for this winter season.

## STREAMFLOW

In spite of the above normal precipitation reported above, streamflow was below normal in every case in the state of Washington with the exception of Okanogan River near Tonasket. Flow at this station was 3 percent above normal and is probably the result of reservoir management of Okanogan Lake. The flow of The Dalles was 20 percent below normal and the Green, below Howard Hanson Dam, 54 percent below normal for the lowest in the state. Forecasts of streamflow for the forthcoming irrigation and water use season now range from 29 percent below normal for the April-July period as measured on the Elwha River near Port Angeles to a high of 17 percent above normal for the Chelan and Entiat Rivers April-June runoff. As can be seen from these forecast numbers, most of the water supply will be near normal in the state of Washington during 1978. Numerical forecasts can be found on the following pages.

# STREAMFLOW FORECASTS - March, 1978

The following summarized runoff forecasts are based principally on mountain snow-cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts. Streamflow figures for 1977 are preliminary and subject to revision.

Basin, Stream and Station	Forecast Runoff 1978	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1977	1976	1975	15-Yr. Average 58-72
<u>COLUMBIA BASIN</u>							
<u>COLUMBIA RIVER SYSTEM</u> **							
Columbia River	40700	88	Apr-Sept	31583	53937	41101	46410
at Birchbank <u>1/</u>	31800	85	Apr-July	23839	38979	32944	37548
	22000	80	Apr-June	18040	26054	22429	27549
Columbia River	64600	94	Apr-Sept	41805	80974	66501	69020
at Grand Coulee <u>1/</u>	54900	94	Apr-July	32813	62715	55870	58368
	43300	94	Apr-June	26413	46556	41377	46049
Columbia River	71600	95	Apr-Sept	43659	86849	73553	75290
bl. Rock Island Dam <u>1/</u>	61000	95	Apr-July	34392	67890	62727	64181
	48100	95	Apr-June	27740	50520	46759	50594
Columbia River	103000	98	Apr-Sept	54130	122876	108901	104600
at The Dalles, Or <u>1/</u>	88400	98	Apr-July	42939	99965	94195	89875
	71700	98	Apr-June	35577	79164	73012	73143
<u>PEND OREILLE RIVER SYSTEM</u> **							
Pend Oreille River	16200	102	Apr-Sept	6041	17638	16946	15950
bl. Box Canyon	14700	100	Apr-July	5312	15979	15271	14677
	12600	99	Apr-June	4816	13687	11814	12767
<u>KETTLE RIVER SYSTEM</u>							
Kettle River	1970	105	Apr-Sept	1145	2434	1860	1873
nr. Laurier	1880	105	Apr-July	1105	2112	1779	1794
	1690	103	Apr-June	1037	1826	1592	1640
Colville River	170	115	Apr-Sept		123	225	148
at Kettle Falls	150	110	Apr-July		106	203	137
	142	111	Apr-June		98	187	128

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee, Noxon Reservoir and pumpage at F. D. Roosevelt Lake.

\*\* Forecasts made by National Weather Service, River Forecast Center, Portland, OR

Basin, Stream and Station	Forecast Runoff 1978	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1977	1976	1975	15-Yr Average 58-72
<u>SPOKANE RIVER SYSTEM***</u>							
Spokane River	3000	100	Apr-Sept	1066	3215	3418	2982
at Post Falls, ID 2/	2900	100	Apr-July	1014	3069	3275	2899
	2780	100	Apr-June	960	2884	3033	2773
<u>OKANOGAN RIVER SYSTEM **</u>							
Similkameen River	1580	104	Apr-Sept	645	1944	1434	1516
nr. Nighthawk	1480	104	Apr-July	605	1720	1339	1424
	1300	106	Apr-June	547	1347	1092	1222
Okanogan River	1750	102	Apr-Sept	708	2185	1582	1723
nr. Tonasket	1600	101	Apr-July	644	1836	1437	1582
	1360	101	Apr-June	583	1382	1181	1349
<u>METHOW RIVER SYSTEM **</u>							
Methow River	1140	111	Apr-Sept		1205	992	1031
nr. Pateros	1070	111	Apr-July		1047	911	963
	920	111	Apr-June		802	728	832
<u>CHELAN RIVER SYSTEM</u>							
Chelan River	1450	116	Apr-Sept	599	1466	1364	1253
at Chelan 3/	1300	117	Apr-July	481	1184	1210	1112
	1030	117	Apr-June	403	836	858	881
Stehekin River	1010	112	Apr-Sept	494	1010	1040	904
at Stehekin	870	112	Apr-July	382	787	796	776
	670	112	Apr-June	311	523	526	600
Entiat	275	115	Apr-Sept		310	268	239
nr. Ardenvoir	255	116	Apr-July		266	244	220
	210	117	Apr-June		190	182	180
<u>WENATCHEE RIVER SYSTEM</u>							
Wenatchee River	1470	112	Apr-Sept	633	1510	1396	1312
at Plain	1320	111	Apr-July	542	1263	1262	1187
	1080	113	Apr-June	479	891	924	956
Wenatchee River	1960	110	Apr-Sept	839	2074	1920	1786
at Peshastin	1820	112	Apr-July	730	1746	1738	1629
	1510	114	Apr-June	653	1238	1279	1324
Stemilt Basin	130*	94	May-Sept		144*	134*	138*
nr. Wenatchee							
Icicle Creek	425	115	Apr-Sept				371
nr. Leavenworth	390	115	Apr-July				342
	320	115	Apr-June				279

\*\* Forecasts made by National Weather Service, River Forecast Center, Portland, OR

\*\*\* Forecasts made by Jack A. Wilson, Soil Conservation Service, Boise, Idaho.

2/ Observed flow corrected for storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage in Lake Chelan.

\* Thousands of Miners' Inches.



Basin, Stream and Station	Forecast Runoff 1978	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore cast period	1977	1976	1975	15-Yr. Average 58-72
<u>YAKIMA RIVER SYSTEM</u>							
Yakima River	124	87	Apr-Sept	80	157	168	142
nr. Martin <u>4/</u>	114	87	Apr-July	70	141	154	131
	100	86	Apr-June	67	117	127	116
Yakima River	860	89	Apr-Sept		1091	1112	968
at Cle Elum <u>5/</u>	770	88	Apr-July		980	1012	877
	695	91	Apr-June		807	852	764
Yakima River	2115	98	Apr-Sept	802	2521	2610	2161
nr. Parker <u>6/</u>	1900	97	Apr-July	657	2205	2367	1960
	1700	98	Apr-June	612	1810	2021	1739
Kachess River	109	87	Apr-Sept	<b>60</b>	142	154	125
nr. Easton <u>7/</u>	100	85	Apr-July	55	131	145	118
	93	88	Apr-June	54	109	120	106
Cle Elum River	435	91	Apr-Sept	248	561	539	477
nr. Roslyn <u>8/</u>	400	91	Apr-July	211	484	492	437
	365	93	Apr-June	192	370	388	372
Bumping River	143	98	Apr-Sept	65	175	179	146
nr. Nile <u>9/</u>	133	99	Apr-July	60	152	163	134
	110	98	Apr-June	55	109	119	112
American River	124	97	Apr-Sept		132	149	128
nr. Nile	119	101	Apr-July		116	137	118
	100	100	Apr-June		86	104	100
Tieton River	242	98	Apr-Sept	123	302	299	247
at Tieton Dam <u>10/</u>	205	97	Apr-July	94	242	253	211
	169	98	Apr-June	77	179	187	172
Naches River	880	99	Apr-Sept		1046	1054	889
nr. Naches <u>11/</u>	800	99	Apr-July		908	952	810
	680	97	Apr-June		717	761	698
Ahtanum Creek	50	104	Apr-Sept		51	57	48
nr. Tampico <u>12/</u>	45	102	Apr-July		45	51	44
	40	103	Apr-June		37	44	39

4/ Observed flow corrected for storage in Lake Keechelus.

5/ Observed flow corrected for storage in Keechelus, Kachess and Cle Elum Lakes and diversion by Kittitas Canal.

6/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping and Rimrock Lakes and diversions by Roza, New Reservation, Sunnyside, Kittitas, and Tieton Canals.

7/ Observed flow corrected for storage in Lake Kachess.

8/ Observed flow corrected for storage in Lake Cle Elum.

9/ Observed flow corrected for storage in Bumping Lake.

10/ Observed flow corrected for storage in Rimrock Lake.

11/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals and City of Yakima.

12/ Observed flow of North and South Forks (Combined).

Basin, Stream and Station	Forecast Runoff 1978	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast period	1977	1976	1975	15-Yr. Average 58-72
<u>LOWER COLUMBIA RIVER SYSTEM</u>							
Mill Creek	26	97	Apr-Sept		41	39	27
nr. Walla Walla	22	92	Apr-July		36	34	24
	20	95	Apr-June		32	30	21
Lewis River	1080	82	Apr-Sept	1040	1285	1188	1319
at Ariel <u>13/</u>	925	80	Apr-July	831	1130	1022	1151
	880	86	Apr-June	761	990	885	1028
Cowlitz River **	1900	90	Apr-Sept	1587	2296	2127	2101
bl. Mayfield Dam	1680	91	Apr-July		1963	1852	1846
	1450	92	Apr-June		1584	1451	1578
Cowlitz River **	2450	88	Apr-Sept	2172	2924	2646	2773
at Castle Rock <u>14/</u>	2150	89	Apr-July	1778	2493	2278	2416
	1850	89	Apr-June	1603	2063	1816	2083
<u>OLYMPIC PENINSULA</u>							
<u>DUNGENESS RIVER SYSTEM</u>							
Dungeness River	135	82	Apr-Sept		160	149	165
nr. Sequim	115	84	Apr-July		128	118	137
	85	82	Apr-June		91	82	104
<u>PUGET SOUND</u>							
<u>SKAGIT RIVER SYSTEM</u>							
Skagit River	2300	95	Mar-Aug		2841	2339	2418
at Newhalem <u>15/</u>							
<u>ELWHA RIVER SYSTEM</u>							
Elwha River	400	73	Apr-Sept		613	544	546
nr. Port Angeles	325	71	Apr-July		492	435	456

13/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs.

14/ Observed flow corrected for storage in Mayfield Reservoir.

15/ Observed flow corrected for storage in Diablo, Ross and Gorge Reservoirs.

\*\* Forecasts made by National Weather Service, River Forecast Center, Portland, OR

# COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about March 1, 1978 as percent of the same date in 1977 and 1976 and average of record

Tributary Basin	No. of Courses Average	1978 Snow Water Expressed as percent of		
		1977	1976	1958-72 Avg.
<u>UPPER COLUMBIA BASIN</u>				
Pend Oreille	17	400	115	99
Kettle	16	323	118	111
Colville	5	554	127	105
Spokane	7	265	85	91
Okanogan	39	449	117	113
Methow	7	1733	181	114
Chelan	4	418	99	122
Entiat	10	633	115	127
Wenatchee	9	599	100	106
Yakima	22	969	121	106
Ahtanum	2	1324	181	122
<u>LOWER COLUMBIA BASIN</u>				
Mill Creek	3	1034	59	67
Klickitat	1	708	109	98
White Salmon	2	967	81	84
Lewis	11	810	61	67
Cowlitz	2	1220	85	86
<u>PUGET SOUND</u>				
White	2	714	107	96
Green	8	790	51	41
Cedar	3	754	21	22
Snoqualmie	3	636	48	58
Skykomish	3	653	78	79
Skagit	12	839	75	98
Baker	8	275	55	64
Nooksack	5	286	58	72
<u>OLYMPIC PENINSULA</u>				
Morse Creek	1	435	-	-
Elwha	1	560	-	56
Dungeness	1	776	-	67



RESERVOIR STORAGE - 1000 ACRE FEET

BASIN OR STREAM	RESERVOIR	USABLE <sup>1/</sup> CAPACITY	1978	1977	Measured (March 1) 1976	Normal*
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	225.1	134.1	17.1	130.0	162.4
Columbia	Franklin D. Roosevelt Lake	5232.0	2027.3	2937.5	3370.7	2843.8
Columbia	Banks Lake	714.9	720.3	714.9	714.9	588.3
Okanogan	Conconully Reservoir	13.0	3.1	8.4	10.7	11.6
Okanogan	Salmon Lake	10.5	6.0	9.5	9.8	7.4
Chelan	Lake Chelan	676.1	194.6	222.1	463.0	234.9
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	148.5	79.8	124.1	105.5
Kachess	Kachess Lake	239.0	195.6	203.8	204.0	183.6
Cle Elum	Lake Cle Elum	436.9	264.2	408.3	327.0	264.5
Bumping	Bumping Lake	33.7	18.2	9.2	8.5	10.2
Tieton	Rimrock Lake	198.0	149.8	129.8	148.0	128.2
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir	1404.1	801.1	659.7	1128.6	873.9
Skagit	Diablo Reservoir	90.6	82.9	86.8	87.5	85.0
Skagit	Gorge Reservoir	9.8	8.2	8.2	8.2	-

<sup>1/</sup> Based on Active Storage

\* 15-year Average 1958-72

# SOIL MOISTURE - MARCH

Drainage Basin and Station	Number	Elev.	Profile Depth	Inches Total Capacity	Soil Moisture Content Inches as of Mar. 1		
					1978	1977	1976
<u>OKANOGAN</u>							
Salmon Meadows	19A2M	4500	48	5.4	-	1.9	3.6
Trout Creek	3-M	3600	48	7.3	3.7	3.3	-
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	-	-	-
Lake Cle Elum	21B14M	2200	48	12.8	-	-	-
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	8.8	7.5	-
Helmers	17C2M	4400	48	12.0	8.4	9.4	-
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	10.8	6.9	11.4

# FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile Depth	Inches Total Capacity	Soil Moisture Content (Inches) as of Oct. 1		
					1977	1976	1975
<u>OKANOGAN</u>							
Salmon Meadows	19A02M	4500	48	5.4	-	3.4	3.2
Trout Creek	3-M	3600	48	7.3	3.2	3.4	3.1
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	-	-	-
Lake Cle Elum	21B14M	2200	48	12.8	-	-	-
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	-	-	7.3
Helmets	17C2M	4400	48	12.0	-	-	6.5
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	6.6	-	8.6

# PRECIPITATION 1/

## Division Average Observations and Departures

Drainage Divisions	FALL		WINTER	
	Sept-Oct Observed	1977 <u>2/</u> Departure	Nov. 1977 - Feb. 1978 Observed	Departure <u>2/</u>
Columbia in Canada	3.41	-1.61	11.26	-2.20
Pend Oreille - Spokane	4.10	+0.06	15.85	+0.83
Northeastern Washington	2.06	-0.41	9.54	+1.43
Southeastern Washington	2.51	0.0	10.19	+1.42
Central Washington	1.08	+0.11	6.95	+2.37
North Central Washington	1.39	-0.21	7.35	+1.57
Northwest Slope Cascades	11.16	-2.05	46.84	-0.26
Southwest Slope Cascades	9.42	+0.74	37.42	+1.94
Northeastern Washington		- Lower Spokane, Colville, Sanpoil and Lower Kettle Drainages.		
Southeastern Washington		- Touchet, Tucannon and Palouse Drainages.		
Central Washington		- Yakima, Wenatchee and Chelan Drainages.		
North Central Washington		- Methow and Okanogan Drainages.		
Northwest Slope Cascades		- Puget Sound Drainages.		
Southwest Slope Cascades		- Lower Columbia Drainages.		

1/ - Preliminary analysis by National Weather Service from data furnished by Meteorological Services of Canada and the National Weather Service.

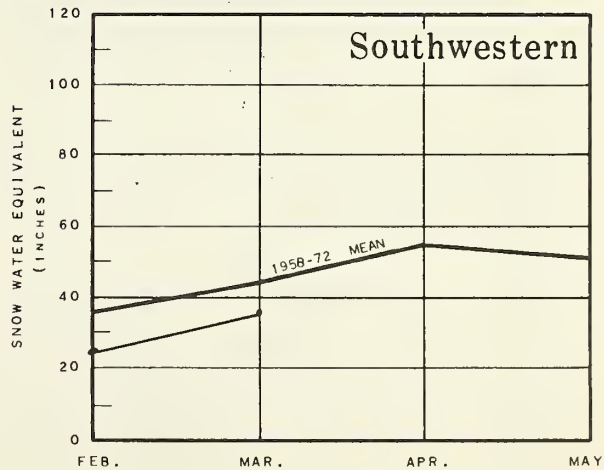
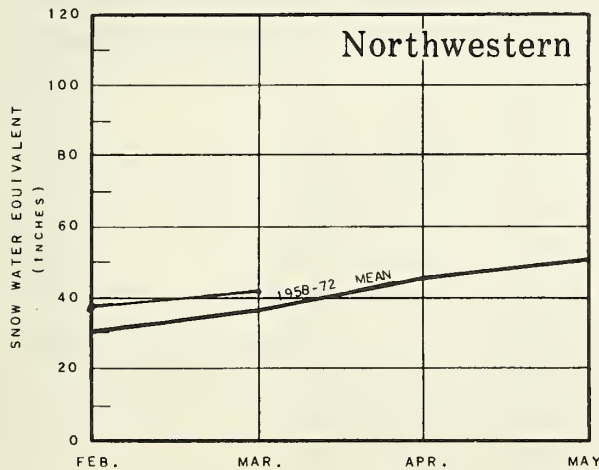
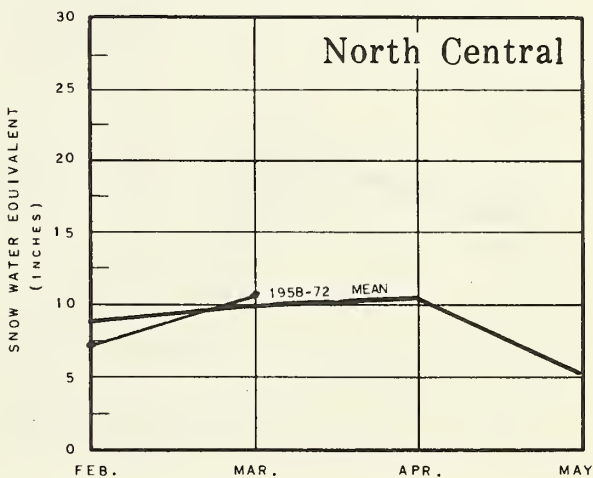
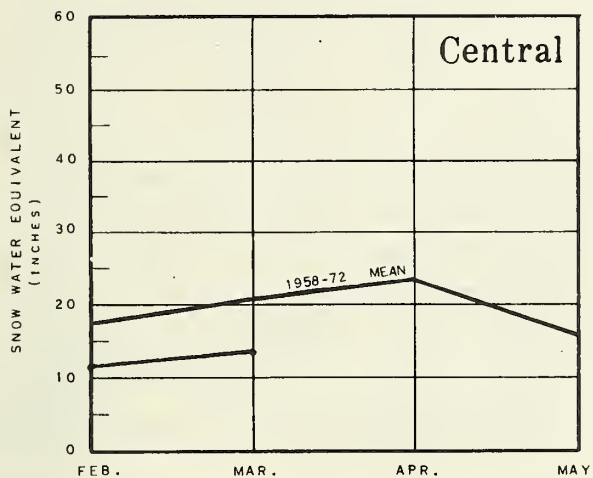
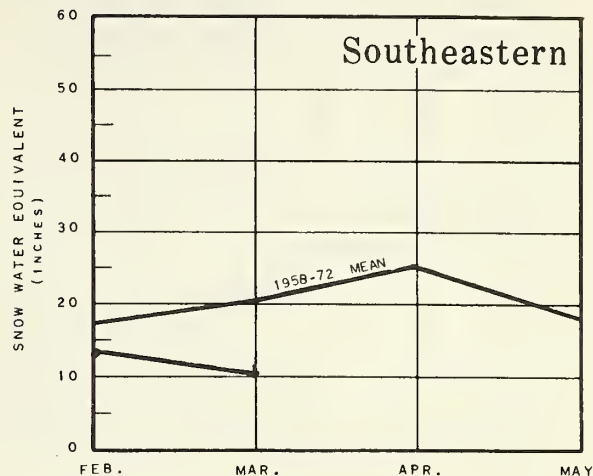
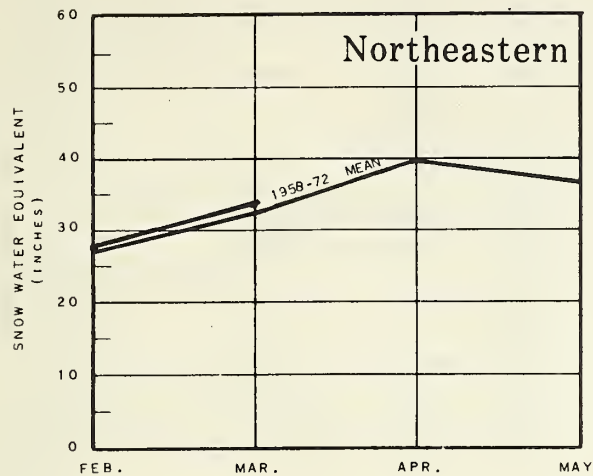
2/ - Departure from 15-year (1958-72) drainage division average.



# WASHINGTON SNOW COVER

1978

## DRAINAGE AREAS

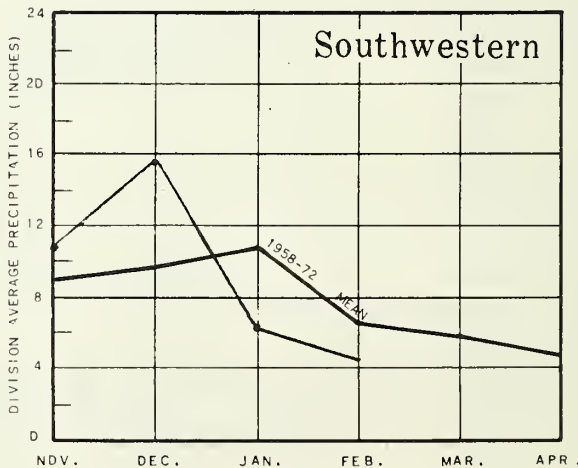
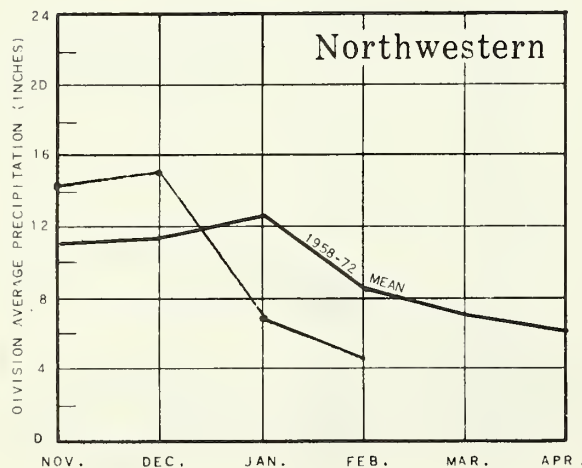
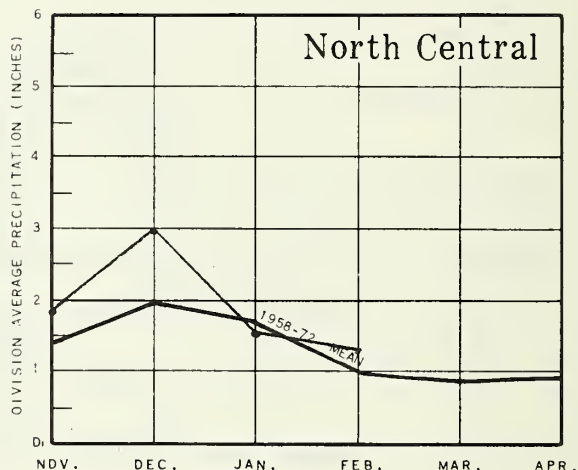
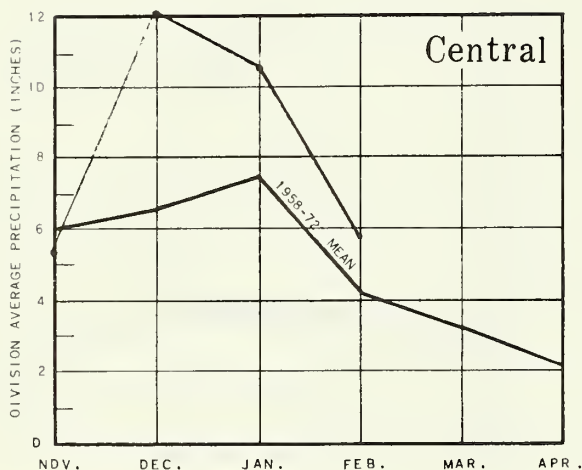
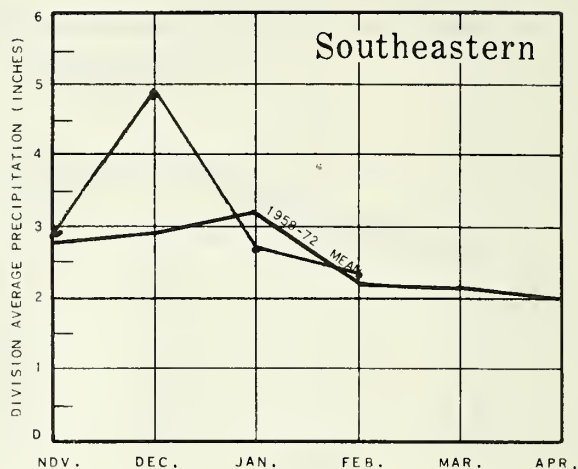
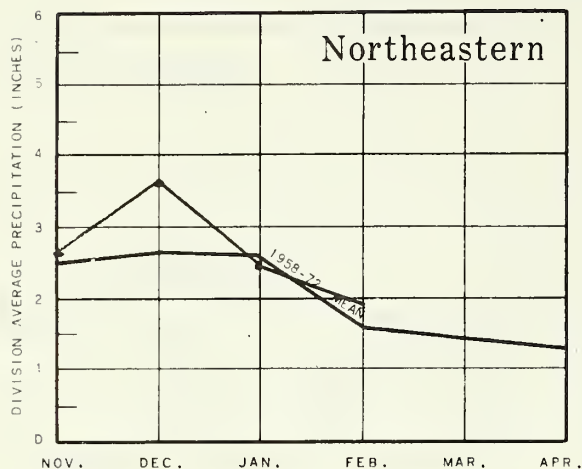


Selected Snow Survey Courses by Soil Conservation Service

# WASHINGTON VALLEY PRECIPITATION

1977 - 1978

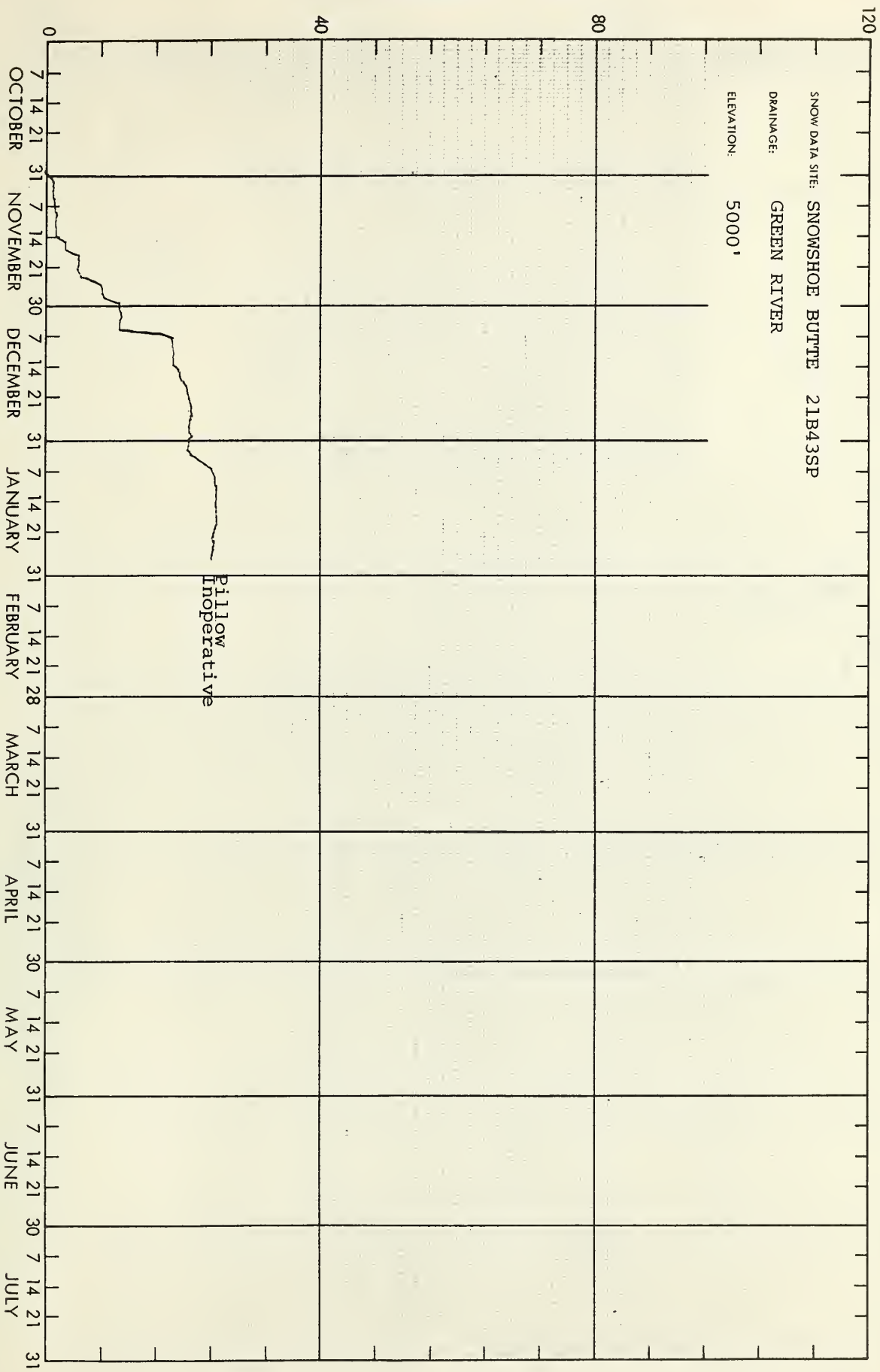
## DRAINAGE AREAS



*Preliminary Analysis by National Weather Service*

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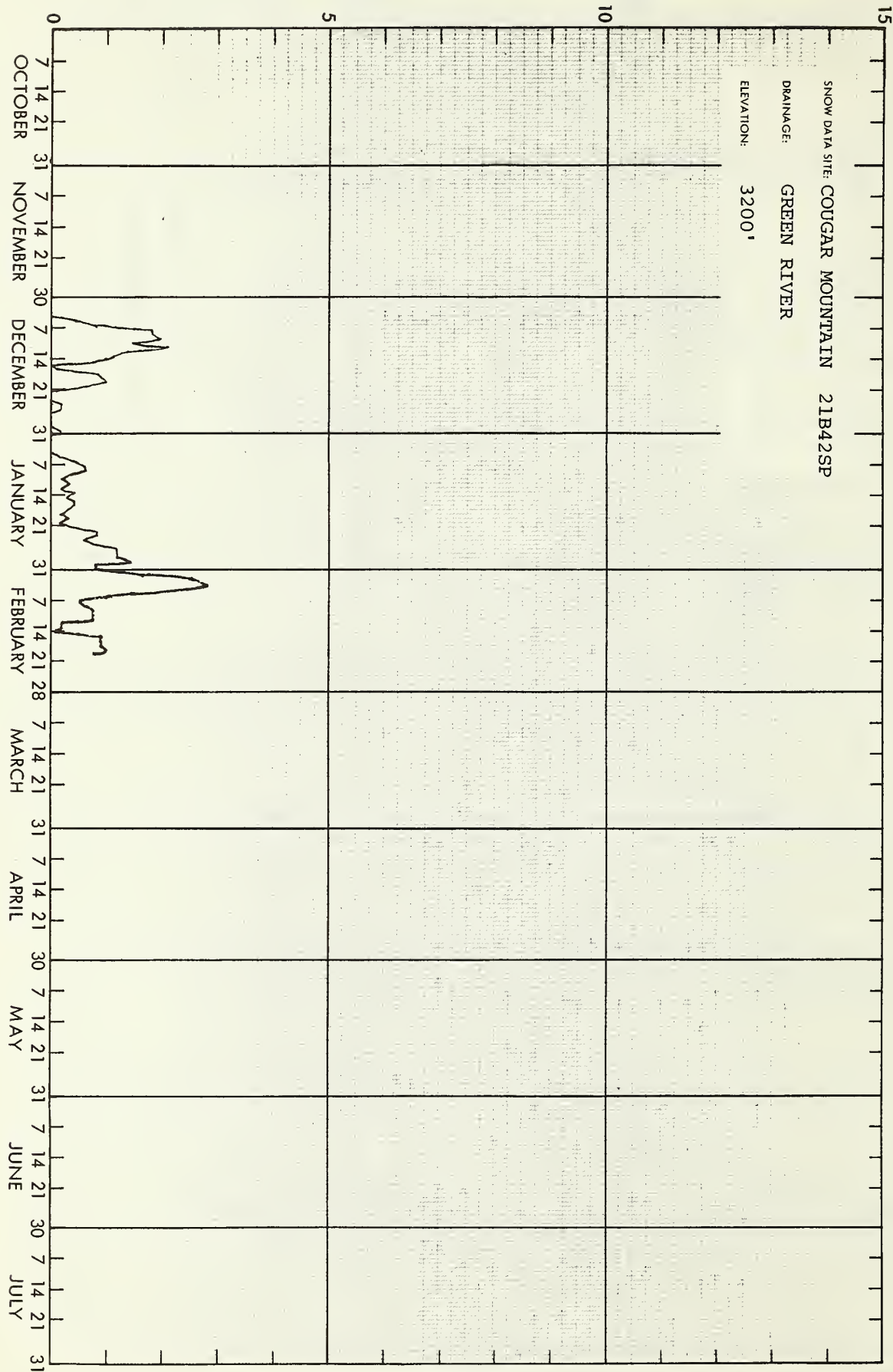
# INCHES OF WATER IN SNOWPACK





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# INCHES OF WATER IN SNOWPACK



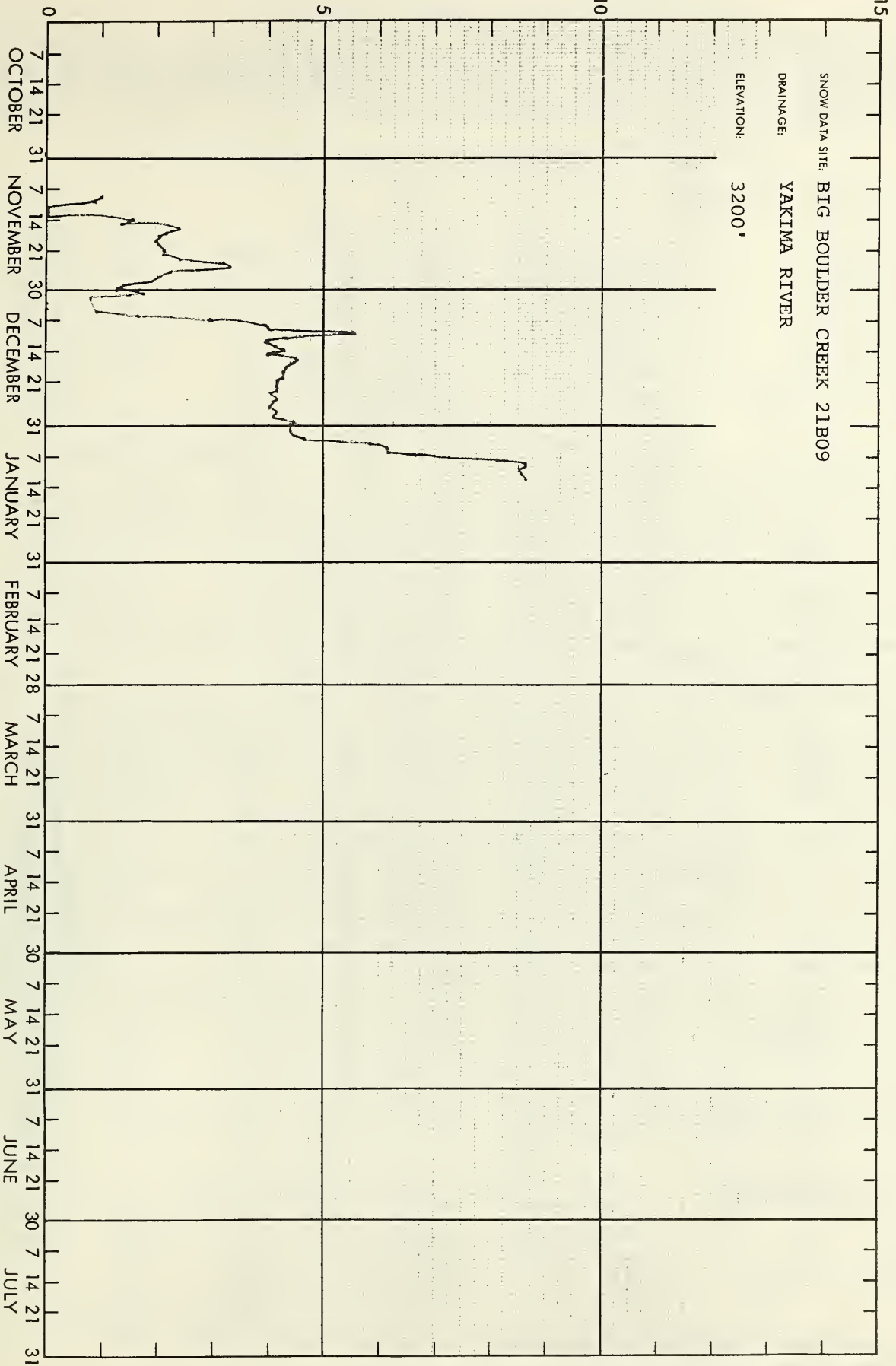
# INCHES OF WATER IN SNOWPACK

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SNOW DATA SITE: BIG BOULDER CREEK 21B09

DRAINAGE: YAKIMA RIVER

ELEVATION: 3200'



## SNOW DATA TO MARCH 1, 1978 - APPENDIX 1

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average <sup>#</sup>

U P P E R C O L U M B I A D R A I N A G EPEND OREILLE RIVER

Baree Creek	15B11	5500	2/28	103	39.0	19.5	43.6
Baree Midway	15B16	4600	2/28	90	31.9	16.5	34.6
Baree Trail	15B15	3800	2/28	36	11.0	1.0	10.5
Benton Meadow	16A02	2344	2/27	20	6.8	1.6	6.1
Benton Spring	16A03	4900	2/27	52	18.0	4.1	17.4
Boyer Mountain	17A02	5250	2/24	67	24.4	4.3	23.7
Brush Creek Timber	14A13	5000	2/27	34	11.0	3.4	11.7
Chewelah	17A04	4923	2/25	47	15.0	3.9	16.2
Heart Lake Trail	14C10	4800	3/3	62	19.8	6.7	21.2
Hoodoo Basin	15C10	6000	3/3	122	46.7	14.8	46.1
Hoodoo Creek	15C01	5900	3/3	116	43.4	12.2	43.2
Lookout	15B02	5250	2/27	90	33.0	10.0	32.7
Mosquito Ridge	16A04A	5100	3/2	106	38.9	-	34.7
Nelson	19-Can	3050	3/1	47	15.0	5.5	14.5*
Schweitzer Bowl	16A06	4500	2/27	71	27.1	8.2	27.8
Schweitzer Ridge	16A05	6100	2/27	106	42.2	11.5	39.9
Winchester Creek	17A03	2970	2/24	32	10.0	2.0	12.1

KETTLE RIVER

Barnes Creek	90-Can	5300	2/27	50	16.9	12.4	18.0*
Big White Mtn.	154-Can	5500	2/27	55	16.1	8.4	17.4*
Boulder Road	18A02	1450	2/24	16	5.2	0.8	4.9
Butte Creek	18A03	4070	2/24	33	10.0	3.4	9.3
Cabin Creek	18A08	3170	2/24	26	8.7	2.5	8.2
Carmi	126-Can	4100	2/27	30	7.8	2.5	6.3*
Farron # 1	17-Can	4000	2/28	50	15.0	3.2	12.3*
Farron # 2	243-Can	4000	2/28	50	15.2	3.1	11.2*
Goat Creek	18A04	3595	2/24	27	8.2	2.9	7.1
Graystoke Lake	5-Can	5950	3/1	56	16.9	6.9	17.0*
Monashee Pass	48A-Can	4500	2/27	42	14.3	8.8	12.7*
Old Glory Mountain	42-Can	7000	3/1	78	28.5	-	24.6*
Snow Caps Creek	18A05	2150	2/24	17	6.0	1.2	5.1
Snow Caps Trail	18A06	2720	2/24	21	7.2	2.5	6.7
Summit G.S.	18A07	4600	2/24	28	8.3	2.5	7.4
Trapping Creek Lower	166-Can	3050	2/27	23	6.5	2.3	5.3*
Trapping Creek Upper	165-Can	4450	2/27	36	9.1	5.1	9.3*

COLVILLE RIVER

Baird	17A06	3215	3/2	34	9.5	2.9	7.1
Carlson	18A09	2885	2/25	15	5.0	0.0	4.6
Chewelah	17A04	4925	2/25	47	15.0	3.9	16.2
Stranger Mountain	17A05	4990	2/25	43	12.6	1.9	13.1
Togo	18A10	3370	2/25	32	10.1	1.2	10.9

# Average based on 1958-72 average

\* Average for years of record



## SNOW DATA TO MARCH 1, 1978 - APPENDIX 2

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

SPOKANE RIVER

Above Burke	15B08	6100	2/27	58	19.1	8.8	-
Copper Ridge	16B02	4800	2/22	57	20.3	7.8	25.7
Fourth of July Summit	16B03	3100	2/22	23	8.0	2.7	7.3
Lookout	15B02	5250	2/27	90	33.0	10.0	32.7
Lower Sands Creek	16B01	3400	2/22	42	14.6	6.2	17.5
Mosquito Ridge	16A04A	5110	3/2	106	38.9	-	34.7
Roland Summit	15B05A	5200	3/2	85	29.6	-	31.3
Sherwin	16C01	3200	2/24	28	8.8	3.5	13.8
Sunset	15B09A	5600				-	33.7

OKANOGAN RIVER

Aberdeen Lake	6A-Can	4300	3/1	30	8.4	3.4	6.0*
Blackwall Mountain	100-Can	6250	2/24	70	26.4	8.5	31.5*
Bouleau Lake	234-Can	4580	2/25	44	13.7	6.5	13.3*
Brenda Mine	193-Can	4800	2/24	44	13.9	5.1	12.8*
Brookmere	27-Can	3200	2/27	33	10.5	2.7	9.0*
Carrs Landing Upper	168-Can	3200	2/25	22	7.0	2.1	4.5*
Clark +	19A08a	7000	3/1	Not Measured		-	19.7
Enderby	130-Can	6250	2/24	94	35.3	20.6	32.8
Esperon Creek Lower	164-Can	4400	2/25	41	11.9	3.5	11.1*
Esperon Creek Middle	163-Can	4700	2/25	46	13.2	5.2	13.9*
Esperon Creek Upper	162-Can	5400	2/25	52	16.2	6.2	17.0*
Freezeout Meadows New	20A38	5000	2/24	60	22.4	12.4	25.7
Graystoke Lake	5-Can	5950	3/1	56	16.9	6.9	17.0*
Hamilton Hill	107-Can	4900	2/25	46	17.3	5.0	14.1*
Harts Pass	20A05A	6500	2/25	100	41.8	12.3	38.8
Horseshoe Basin +	19A05a	7000	3/1	Not Measured		-	11.6
Isintok Lake	152-Can	5510	2/26	32	9.8	2.1	7.7*
Lost Horse Mountain	105-Can	6300		Late Report		3.8	8.6*
Loup Loup	19A07	4650	2/24	37	10.9	0.4	9.5
McCulloch	4-Can	4200	2/26	28	7.5	3.4	6.3*
Missezula Mountain	106-Can	5100	2/24	33	11.8	3.0	9.0*
Mission Creek	5A-Can	6000	2/27	54	18.1	10.5	17.6*
Monashee Pass	48A-Can	4500	2/27	42	14.3	8.8	12.7*
Mount Kobau	156-Can	5950	2/27	40	11.1	2.4	11.6*
Muckamuck +	19A09a	6390	3/1	55	16.5	3.0	15.1
Mutton Creek No. 1	19A01	5700	2/23	51	14.7	0.0	12.9
Mutton Creek No. 2	19A04	6000	2/23	45	12.8	0.6	13.3
Mutton Creek No. 2SP	19A11SP	6000	2/23	-	15.0	0.0	New
New Copper Mountain	46A-Can	4300	2/23	26	5.5	1.2	5.7*
New Penticton Res. #2	183-Can	5225	2/28	34	9.1	3.6	8.1*
Nickel Plate Mtn.	47-Can	6200	2/26	27	8.3	4.7	7.2*

# Average based on 1958-72 average

\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation

SNOW DATA TO MARCH 1, 1978 - APPENDIX 3

SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

OKANOGAN RIVER (Cont.)

Oyama Lake	203-Can	4400	2/27	30	8.0	3.7	6.7*
Paysayten +	20A28a	4300	3/1	54	16.2	6.9	15.4
Postill Lake	55-Can	4500	2/28	32	8.5	4.9	7.5*
Quartette Lake	34-Can	4000	2/23	31	9.8	2.0	8.7*
Rusty Creek	19A03	4000	2/23	33	9.7	0.0	7.1
Salmon Meadows	19A02	4500	2/23	41	11.2	0.0	9.9
Silver Star Mountain	99-Can	6050	2/25	73	28.9	14.3	24.3*
Starvation Mtn +	19A10a	6750	3/1	67	20.1	6.0	18.3
Summerland Reservoir	3A-Can	4200	2/25	35	10.6	3.8	9.0*
Touts Coulee	19A06	2845	2/23	15	4.5	0.3	4.0
Trout Creek	3-Can	4700	2/25	30	8.1	2.7	6.6*
Vaseux Creek	233-Can	4600	2/28	27	5.3	2.8	7.0*
White Rocks Mountain	70-Can	6000	2/28	63	26.9	7.1	19.5*

METHOW RIVER

Billy Goat Pass +	20A10a	6409	3/1	Not Measured	-	25.8
Dollar Watch +	20A29a	7000	3/1	Not Measured	-	25.8
Harts Pass	20A05A	6500	2/25	100	41.8	12.3
Horseshoe Basin +	19A05a	7000	3/1	Not Measured	-	11.6
Loup Loup	19A07	4650	2/24	37	10.9	0.4
Mutton Creek No. 1	19A01	5700	2/23	51	14.7	0.0
Mutton Creek No. 2	19A04	6000	2/23	45	12.8	0.6
Mutton Creek No. 2 SP	19A11SP	6000	2/23	-	15.0	0.0
Rusty Creek	19A03	4000	2/23	33	9.7	0.0
Salmon Meadows	19A02	4500	2/23	41	11.2	0.0
War Creek Pass +	20A31a	6500	3/1	Not Measured	-	40.5

CHELAN LAKE BASIN

Cloudy Pass +	20A22a	6500	3/1	138	56.6	11.2
Greenwood Flat +	20A25a	3540	3/1	Not Measured	-	22.9
Little Meadows +	20A24a	5275	3/1	125	51.2	11.2
Lyman Lake	20A23A	5900	3/1	Not Measured	19.7	52.5
Park Creek Flat +	20A13a	2220	3/1	Not Measured	-	31.4
Park Creek Ridge	20A12A	4600	3/1	124	50.8	11.0
Petersons +	20A16a	3730	3/1	Not Measured	10.5	32.9
Rainy Pass	20A09	4780	2/25	100	41.1	12.3
Safety Harbor	20A30A	6300	3/1	Not Measured	-	25.7
War Creek Pass +	20A31a	6500	3/1	Not Measured	-	40.5

# average based on 1958-72 average

+ Snow water equivalent estimated from aerial stadia observation

\* Average for years of record

## SNOW DATA TO MARCH 1, 1978 - APPENDIX 4

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

ENTIAT RIVER

Blue Creek G.S.	20B28a	5425	2/24	120	49.2	13.4	New
Brief	20B19	1600	2/25	26	9.9	0.0	7.5
Entiat Meadows +	20A33a	4540	2/24	126	51.7	14.7	45.7
Entiat River Trail +	20A34a	3325	2/24	82	29.5	10.6	21.8
Four Mile Ridge +	20B27a	6800	2/24	98	40.2	3.8	-
Fox Camp +	20A36a	6510	2/24	170	69.7	19.2	54.6
Pope Ridge	20B20	3540	2/28	69	24.8	2.1	16.5
Pugh Ridge +	20A32a	6725	2/24	99	40.6	7.4	34.5
Shady Pass	20A37	6200	2/27	85	34.4	4.4	-
Snow Brushy +	20A35a	3910	2/24	129	46.4	12.5	37.7
Tommy Creek +	20B21a	4900	2/24	80	32.8	3.2	28.3

WENATCHEE RIVER

Berne-Mill Creek	21B23	2925	2/14	70	28.0	2.8	23.9
			2/27	70	27.7	4.5	24.7
Berne-Mill Creek New SP	21B41	3240	2/27	56	23.2	2.9	21.0
Blewett Pass No. 2	20B02	4270	2/27	50	16.8	1.9	14.9
Chiwaukum G. S.	20B16	1810	2/14	33	12.4	2.7	11.2
			2/27	32	11.6	2.9	11.6
Fish Lake	21B04	3371	2/24	73	28.5	7.1	31.3
Lake Wenatchee	20B05	1970	2/14	44	16.9	3.2	13.6
			2/27	43	17.0	3.7	13.9
Leavenworth R.S.	20B17	1127	2/10	15	6.4	0.0	5.7
			2/27	7.6	3.3	0.0	4.2
Lyman Lake	20A23A	5900	3/1	Not Measured		19.7	52.5
Merritt	20B18	2140	2/14	50	19.6	2.5	15.5
			2/27	47	19.1	2.8	15.2
Stevens Pass	21B01	4070	2/14	112	45.2	6.8	42.5
			2/27	110	45.7	11.7	45.7
Stevens Pass Sand Shed	21B45	3700	2/14	86	33.6	2.6	-
			2/27	81	33.5	4.4	-

SQUILCHUCK CREEK

Beehive Springs	20B03	4400	2/27	38	11.8	0.0	7.9
Scout-A-Vista	20B04	3400	2/27	40	12.7	0.0	8.1

STEMILT CREEK

Jump-Off	20B08	4450	2/28	45	14.0	0.0	8.3
Stemilt Slide	20B06	5000	2/27	52	17.4	0.0	15.1
Upper Wheeler	20B07	4400	2/27	37	12.3	0.0	10.1

# Average based on 1958-72 average

+ Snow water equivalent estimated from aerial stadia observation



## SNOW DATA TO MARCH 1, 1978 - APPENDIX 5

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

COLOCKUM CREEK

Colockum Creek Upper	20B22	5300	2/28	47	16.0	0.0	-
Colockum Creek Lower	20B23	4300	2/28	43	13.3	0.0	-
Trough # 2	20B25SP	5310	2/28	56	19.0	0.0	New

YAKIMA RIVER

Ahtanum R. S.	21C11	3100	2/24	34	9.0	0.5	6.7
Big Boulder Creek	21B09	3200	2/24	40	15.3	2.0	18.5
Blewett Pass No. 2	20B02	4270	2/27	50	16.8	1.9	14.9
Bumping Lake	21C08	3450	2/15	41	12.8	0.0	15.2
			2/28	40	14.1	0.0	15.3
Bumping Lake New	21C36	3400	2/15	48	15.6	0.0	19.6
			2/28	50	16.8	1.0	20.0
Cayuse Pass	21C06	5300	3/1	Not Measured		11.4	70.4
Colockum Pass	20B09	5370	2/23	56	22.0	0.0	14.5
Cooke Creek	20B10	4123	2/23	19	6.4	0.0	6.1
Corral Pass	21B13	6000	2/27	77	30.0	3.9	34.3
Fish Lake	21B04	3371	2/24	73	28.5	7.1	31.3
Green Lake	21C10	6000	2/24	82	32.2	3.8	29.1
Grouse Camp	20B11	5385	2/24	56	19.5	1.2	15.3
High Creek	20B12	2930	2/24	20	6.9	0.0	5.2
Joe Lake +	21B46a	4624	3/1	Not Measured		18.0	-
Lake Cle Elum	21B14M	2200	2/15	22	7.2	0.0	8.2
			3/1	21	7.0	0.9	8.1
Lemah Creek +	21B47a	3327	2/27	99	37.6	6.0	-
Manashtash	20C01	3935	2/27	23	8.5	0.0	4.3
Morse Lake	21C17	5400	2/27	127	50.8	7.7	47.7
Nanum	20B13	3875	2/24	25	8.3	0.3	9.6
Olallie Meadows	21B02	3625	2/27	59	23.3	3.8	40.6
Satus Pass	20D01	4030	2/27	31	8.5	1.2	8.7
Stampede Pass SP	21B10	3860	2/15	85	41.6	4.0	34.2
			3/1	85	40.3	5.8	36.2
Trail Creek	20B14	3360	2/24	Patches	0.0	0.0	2.2
Tunnel Avenue	21B08	2450	2/13	42	13.6	0.0	20.1
			2/27	41	14.1	1.2	21.2
Van Epps Pass +	20B26a	5925	2/27	102	38.8	14.6	-
Walters Flat	20B15	3360	2/24	23	7.9	0.0	6.9
Waptus Lake +	21B49a	3024	2/27	81	30.8	8.0	-
White Pass (E. Side)	21C28	4500	2/14	53	17.0	0.0	20.8
			3/3	58	18.4	1.4	22.0

AHTANUM CREEK

Ahtanum R.S.	21C11	3100	2/24	34	9.0	0.5	6.7
Green Lake	21C10	6000	2/24	82	32.2	3.8	29.1

# Average based on 1958-72 average

+ Snow water equivalent estimated from aerial stadia observation

## SNOW DATA TO MARCH 1, 1978 - APPENDIX 6

SNOW			THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

L O W E R C O L U M B I A D R A I N A G EASOTIN CREEK

Spruce Springs	17C04	5700	2/25	50	16.8	2.0	23.6
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MILL CREEK

Homestead	17C01	4030	2/21	15	5.9	0.0	7.4
Martin Springs	17C02	4400	2/21	28	8.7	0.5	11.9
Tollgate	18D3M	5070	2/28	30	10.2	3.1	21.1

KLICKITAT RIVER

Satus Pass	20D01	4030	2/27	31	8.5	1.2	8.7
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WHITE SALMON RIVER

Cultus Creek	21C12	4000	2/27	99	35.6	4.4	40.5
Surprise Lakes	21C13A	4250	2/27	98	36.0	3.2	44.2

WIND RIVER

Old Man Pass	21D19	3100	2/27	22	5.9	0.8	17.2
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LEWIS RIVER

Blue Lake +	21C22a	4800	2/27	164	60.7	10.5	69.7
Bob's Trail	21C21	2200	2/23	0	0.0	0.0	14.2
Calamity Ridge +	22D01a	2500	2/27	0	0.0	0.1	6.7
Council Pass +	21C18a	4200	2/27	78	28.9	3.1	37.1
Cultus Creek	21C12	4000	2/27	99	35.6	4.4	40.5
Divide Meadow +	21C29a	5600	2/27	100	37.0	5.5	50.9
Grand Meadow	21C25	3500	2/23	34	12.1	1.1	23.8
Lone Pine Shelter	21C26	3800	2/23	50	19.0	2.3	35.0
Marble Mountain +	22C05a	3200	2/23	30	12.0	1.1	31.4
New Muddy River	22C06	2000	2/23	0	0.0	0.0	10.6
Old Man Pass	21D19	3100	2/27	22	5.9	0.8	17.2
Plains of Abraham +	22C01a	4400	2/23	140	51.8	4.6	58.5
Smith Creek Road	22C04	2100	2/23	0	0.0	0.0	17.2
Spencer Meadow +	21C20a	3400	2/23	10	3.6	1.1	21.5
Surprise Lakes	21C13A	4250	2/27	98	36.0	3.2	44.2
Table Mountain +	21C24a	4200	2/27	100	37.0	3.6	41.7
Timbered Peak +	21D18a	3000	2/27	6	1.6	0.8	16.0

# Average based on 1958-72 average

+ Snow water equivalent estimated from aerial stadia observation

# SNOW DATA TO MARCH 1, 1978 - APPENDIX 7

## SNOW

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Number	Elevation				Last Year	Average #

### COWLITZ RIVER

Cavuse Pass	21C06	5300	3/1	Not Measured	11.4	70.4	
Plains of Abraham +	22C01a	4400	2/23	140	51.8	4.6	58.5
White Pass (E. Side)	21C28	4500	2/14	53	17.0	0.0	20.8
			3/3	58	18.4	1.4	22.0

### PUGET SOUND DRAINAGE

#### WHITE RIVER

Cayuse Pass	21C06	5300	3/1	Not Measured	11.4	70.4	
Corral Pass	21B13	6000	2/27	77	30.0	3.9	34.3
Morse Lake	21C17	5400	2/27	127	50.8	7.7	47.7

#### GREEN RIVER

Airstrip	21B24	1800	3/1	2.7	0.3	0.0	4.4
Charley Creek	21B25	1200	3/1	0	0.0	0.0	1.2
Cougar Mountain SP	21B42SP	3200				0.0	-
Grass Mtn. No. 2	21B27	2900	3/1	12	1.8	0.0	19.4
Grass Mtn. No. 3	21B28	2100	3/1	4.1	0.4	0.0	5.7
Lester Creek	21B29	3100	3/1	39	9.9	1.9	21.3
Lynn Lake	21B50	4000	3/1	17	4.3	0.3	-
Sawmill Ridge	21B31	4700	3/1	67	23.0	3.7	34.1
Snowshoe Butte SP	21B43SP	5000	2/27	92	38.0	5.6	-
Stampede Pass SP	21B10	3860	2/16	85	41.6	4.0	34.2
			2/27	85	40.3	5.8	36.2
Twin Camp	21B30	4100	3/1	Not Measured		0.3	21.6

#### CEDAR RIVER

City Cabin	21B03	2390	2/27	3	0.9	0.9	13.5
Mt. Gardner	21B21	3300	2/24	0	0.0	0.4	15.6
Mt. Lindsay	21B16	2500	2/24	0	0	0.6	12.8
Mt. Washington New	21B15	3000	2/24	0	0.0	0.5	-
Rex River	21B17	2400	2/24	0	0.0	0.6	8.9
S. F. Cedar	21B06	3000	2/24	10	3.6	0.3	17.3
Tinkham Creek	21B20	3400	2/27	24	7.7	0.8	20.0

#### SNOQUALMIE RIVER

Alpine Meadow	21B48	3500	2/27	47	20.0	4.1	-
Lake Elizabeth	21B19	2900	2/28	59	21.0	2.6	36.4
Olallie Meadows	21B02	3625	2/27	59	23.3	3.8	40.6
S. F. Tolt	21B18	1900	2/27	0	0.0	0.0	2.7

# Average based on 1958-72 average

+ Snow water equivalent estimated from aerial stadia observation



## SNOW DATA TO MARCH 1, 1978 - APPENDIX 8

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

SKYKOMISH RIVER

Lake Elizabeth	21B19	2900	2/28	59	21.0	2.6	36.4
Stevens Pass	21B01	4070	2/14	112	45.2	6.8	42.5
			2/27	110	45.7	11.7	45.7
Stevens Pass Sand Shed	21B45	3700	2/14	86	33.6	2.6	-
			2/27	81	33.5	4.4	-

SKAGIT RIVER

Beaver Creek Trail	21A04	2200	2/24	34	12.4	0.0	13.0
Beaver Pass	21A01	3680	2/24	59	23.6	1.2	28.3
Brown Top +	21A28a	6000	2/24	122	50.0	16.0	-
Cloudy Pass	20A22a	6500	3/1	114	46.7	11.2	37.4
Devils Park	20A04A	5900	2/24	95	39.2	12.6	39.4
Freezeout Creek Trail	20A01	3500	2/24	31	10.0	0.6	11.8
Freezeout Meadows New	20A38	5000	2/24	60	22.4	12.4	25.7
Granite Creek	21A29	3500	2/25	42	14.9	4.7	-
Harts Pass	20A05A	6500	2/25	100	41.8	12.3	38.8
Klesilkwa	35B-Can	3700	2/24	26	10.0	0.3	12.8*
Lyman Lake +	20A23A	5900	3/1	Not Measured		19.7	52.5
Meadow Cabins	20A08	1900	2/24	17	6.2	0.0	6.8
New Hozomeen Lake	21A30	2800	2/24	28	8.8	0.0	-
New Tashme	26A-Can	2500	2/28	28	9.6	1.5	11.3*
Quartette Lake	34-Can	4000	2/23	31	9.8	2.0	8.7*
Rainy Pass	20A09	4780	2/25	100	41.1	12.3	36.0
Thunder Basin	20A07	4200	2/24	48	17.2	4.2	19.8

BAKER RIVER

Baker Pass +	21A27a	4900	2/15	Marker Missing	-	-	
			3/1	Marker Missing	29.0	-	
Dock Butte	21A11A	3800	2/11	120	38.0	-	58.4
			2/24	94	38.0	16.0	61.3
Easy Pass	21A07A	5200	2/11	156	62.0	18.8	64.3
			2/24	142	57.0	17.0	72.0
Jasper Pass	21A06A	5400	2/11	169	68.0	23.0	72.3
			2/24	160	64.0	26.0	82.8
Marten Lake	21A09A	3600	2/11	121	48.0	17.5	59.4
			2/24	112	45.0	19.0	67.6
Mount Blum +	21A18a	5800	2/11	126	50.0	-	49.6
			2/24	121	48.0	20.0	58.2
Panorama New	21A26	4300	2/13	117	48.4	9.5	-
			2/26	109	49.1	14.0	-
Rocky Creek	21A12A	2100	2/11	30	12.0	5.0	-
			2/24	18	7.0	-	25.4

# Average based on 1958-72 average.

\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation

## SNOW DATA TO MARCH 1, 1978 - APPENDIX 9

**SNOW**

DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR			PAST RECORD	
			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Number	Elevation				Last Year	Average #

BAKER RIVER (Cont.)

Schreibers Meadow	21A10A	3400	2/11	89	36.0	-	47.6
			2/24	70	28.0	10.0	53.8
S. F. Thunder Creek	21A14A	2200	2/11	0	0.0	-	4.9
			2/24	0	0.0	-	8.1
Watson Lakes	21A08A	4500	2/11	101	40.0	-	49.2
			2/24	95	38.0	-	57.6

NOOKSACK RIVER

Bald Mountain +	21A19a	4400	2/27	66	27.7	18.6	42.9
Canyon +	21A20a	5100	3/1	Not Measured		29.1	48.3
Glacier Creek	21A23	3700	2/26	24	9.4	1.6	21.6
Panorama New	21A26	4300	2/13	117	48.4	9.5	-
			2/26	109	49.1	14.0	-
Twin Lakes +	21A21a	5200	3/1	Not Measured		27.3	62.3

O L Y M P I C P E N I N S U L ADUNGENESS RIVER

Deer Park	23B04	5200	2/27	38	13.2	1.7	19.6
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MORSE CREEK

Cox Valley	23B14	4500	2/24	70	27.4	6.3	-
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ELWHA RIVER

Hurricane	23B03	4500	2/24	35	11.2	2.0	20.0
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# Agencies Assisting with Snow Surveys

## GOVERNMENT AGENCIES

### Canada:

Department of Lands, Forests and Water Resources,  
Water Resources Service, British Columbia

### States:

Washington State Department of Ecology  
Washington State Department of Natural Resources

### Federal:

Department of the Army  
Corps of Engineers  
U. S. Department of Agriculture  
Forest Service  
U. S. Department of Commerce  
NOAA, National Weather Service  
U. S. Department of the Interior  
Bonneville Power Administration  
Bureau of Reclamation  
Geological Survey  
National Park Service

## PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.  
Pacific Power and Light Company  
Puget Sound Power and Light Company  
Washington Water Power Company

## OTHER PUBLIC AGENCIES

Okanogan Irrigation District  
Wenatchee Heights Irrigation District

## MUNICIPALITIES

City of Tacoma  
City of Seattle

*Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.*

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